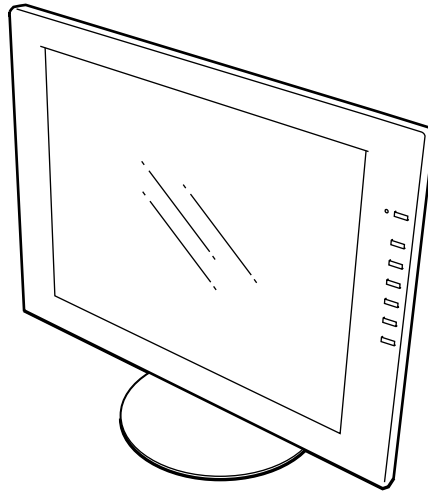


SDM-S51

SERVICE MANUAL

US Model
Canadian Model
AEP Model



SPECIFICATIONS

LCD panel	Panel type: a-Si TFT Active Matrix Picture size: 15.0 inch	Dimensions (width/height/depth)	Display (upright): Approx. 387 × 330 × 175 mm (15 ¹ / ₄ × 13 × 7 inches) (with stand)
Input signal format	RGB operating frequency* Horizontal: 28 - 60 kHz Vertical: 48 - 75 Hz		Approx. 387 × 281 × 48 mm (15 ¹ / ₄ × 11 ¹ / ₈ × 1 ¹⁵ / ₁₆ inches) (without stand)
Resolution	Horizontal: Max.1024 dots Vertical: Max.768 lines	Mass	Approx. 3.7 kg (8 lb 3 oz) (with stand) Approx. 2.9 kg (6 lb 5 oz) (without stand)
Input signal levels	RGB video signal 0.7 Vp-p, 75Ω, positive SYNC signal TTL level, 2.2 kΩ, positive or negative (Separate horizontal and vertical, or composite sync) 0.3 Vp-p, 75Ω, negative (Sync on green)	Plug & Play Accessories	DDC2B See page 7.
Power requirements	100 - 240 V, 50 - 60 Hz, Max. 0.56A	* Recommended horizontal and vertical timing condition Horizontal sync width duty should be more than 4.8% of total horizontal time or 0.8 μs, whichever is larger. Horizontal blanking width should be more than 2.5 μsec. Vertical blanking width should be more than 450 μsec.	
DC input	DC 12 V (supplied AC adapter)		
Power consumption	Max. 25 W		
Operating temperature	5 - 35 °C		

Design and specifications are subject to change without notice.

TFT LCD Color Computer DISPLAY
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

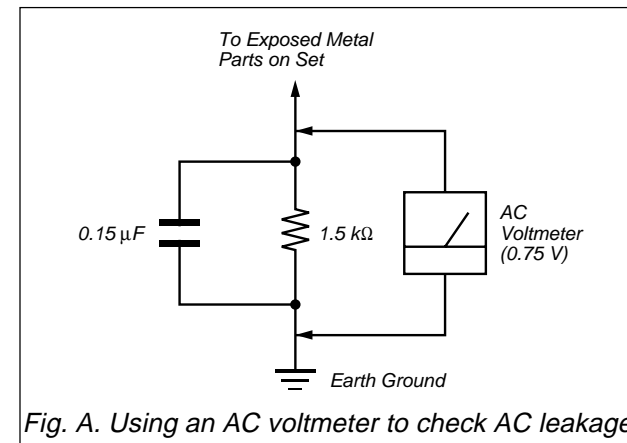
1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
8. Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC Leakage. Check leakage as described right.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes).

Leakage current can be measured by any one of three methods.


1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOMs that are suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)



WARNING!!


NEVER TURN ON THE POWER IN A CONDITION IN WHICH THE DEGAUSS COIL HAS BEEN REMOVED.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL FOR SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

AVERTISSEMENT!!

NE JAMAIS METTRE SOUS TENSION QUAND LA BOBINE DE DEMAGNETISATION EST ENLEVÉE.

**ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!
LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE  SONT CRITIQUES POUR LA SÉCURITÉ. NE LES REMPLACER QUE PAR UNE PIÈCE PORTANT LE NUMÉRO SPECIFIÉ. LES RÉGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT SONT IDENTIFIÉS DANS LE PRÉSENT MANUEL. SUIVRE CES PROCÉDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONCTIONNEMENT EST SUSPECTÉ.**

POWER SAVING FUNCTION

This monitor meets the power-saving guidelines set by VESA, ENERGY STAR, and NUTEK. If the monitor is connected to a computer or video graphics board that is DPMS (Display Power Management Signaling) compliant, the monitor will automatically reduce power consumption as shown below.

SDM-S51

Power mode	Power consumption	⏻ (power) indicator
normal operation	25 W (max.)	green
active off* (deep sleep)**	3 W (max.)	orange
power off	3 W (max.)	off

* When your computer enters the active off mode, the input signal is cut and NO INPUT SIGNAL appears on the screen. After 20 seconds, the monitor enters the power saving mode.

** deep sleep is the power saving mode defined by the Environmental Protection Agency.

AUTOMATIC PICTURE QUALITY ADJUSTMENT FUNCTION

When the monitor receives an input signal, it automatically matches the signal to one of the factory preset modes stored in the monitor's memory to provide a high quality picture at the center of the screen. (See Appendix for a list of the factory preset modes.)

For input signals that do not match one of the factory preset modes, the automatic picture quality adjustment function of this monitor automatically adjusts the picture position, phase, and pitch, and ensures that a clear picture appears on the screen for any timing within the monitor's frequency range (horizontal: 28 - 60 kHz , vertical: 48 - 75 Hz).

Consequently, the first time the monitor receives input signals that do not match one of the factory preset modes, the monitor may take a longer time than normal for displaying the picture on the screen. This adjustment data is automatically stored in memory so that next time, the monitor will function in the same way as when the monitor receives the signals that match one of the factory preset modes.

In all modes as above, if the picture is adjusted, the adjustment data is stored as a user mode and automatically recalled whenever the same input signal is received.

Note

While the automatic picture quality adjustment function is activated, only the (power) switch will operate.

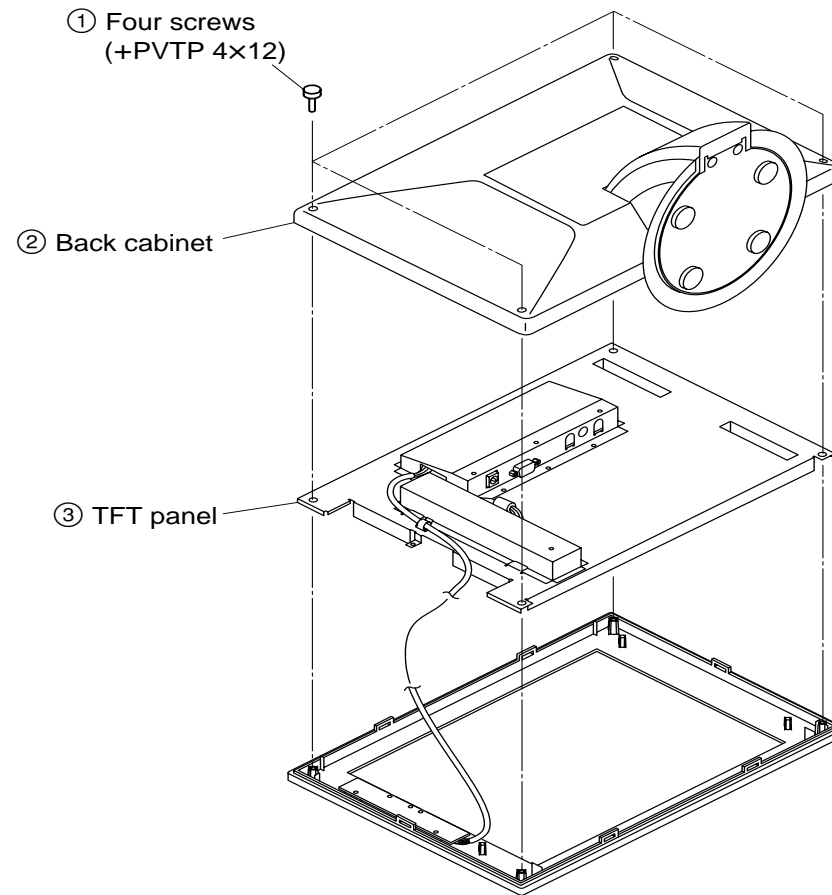
TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>
1. DISASSEMBLY			4. EXPLODED VIEWS		
1-1.	Back Cabinet and TFT Panel Removal	1-1	4-1.	Chassis	4-2
1-2.	Keyboard Mount Removal	1-2	4-2.	Packing Materials	4-3
1-3.	Inverter Mount Removal	1-3			
1-4.	I/F Board Removal	1-4	5. ELECTRICAL PARTS LIST		5-1
1-5.	TFT Panel Removal	1-5			
2. ADJUSTMENTS					
2-1.	Functional Alignment (1)	2-1			
2-2.	Functional Alignment (2)	2-2			
2-3.	Table 1&2	2-3			
2-4.	Timing Specification	2-4			
2-5.	W/B Alignment Procedure	2-5			
3. DIAGRAMS					
3-1.	Circuit Boards Location	3-1			

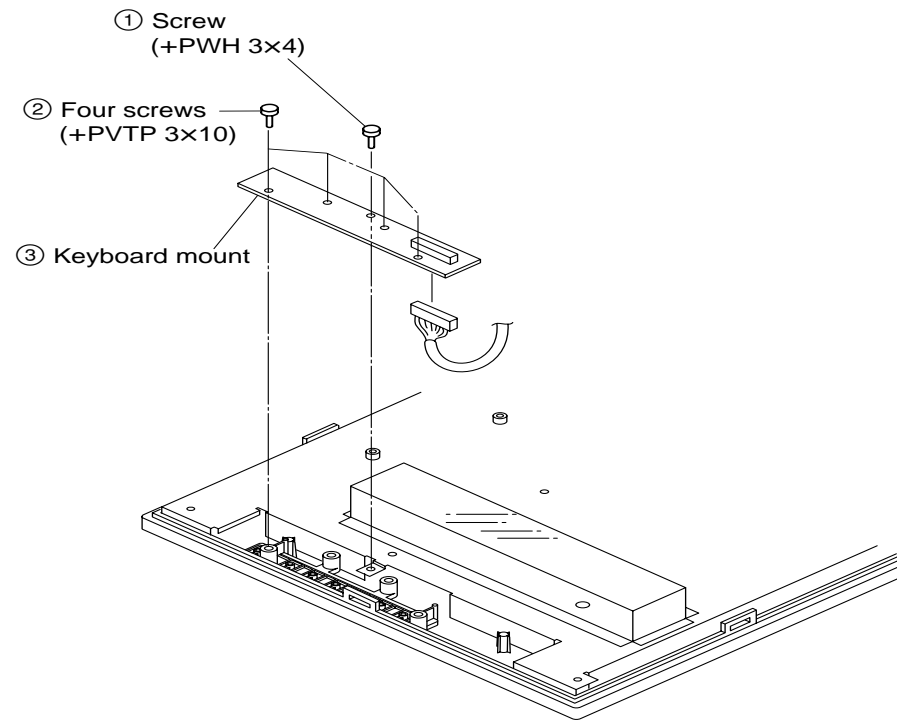
SECTION 1

DISASSEMBLY

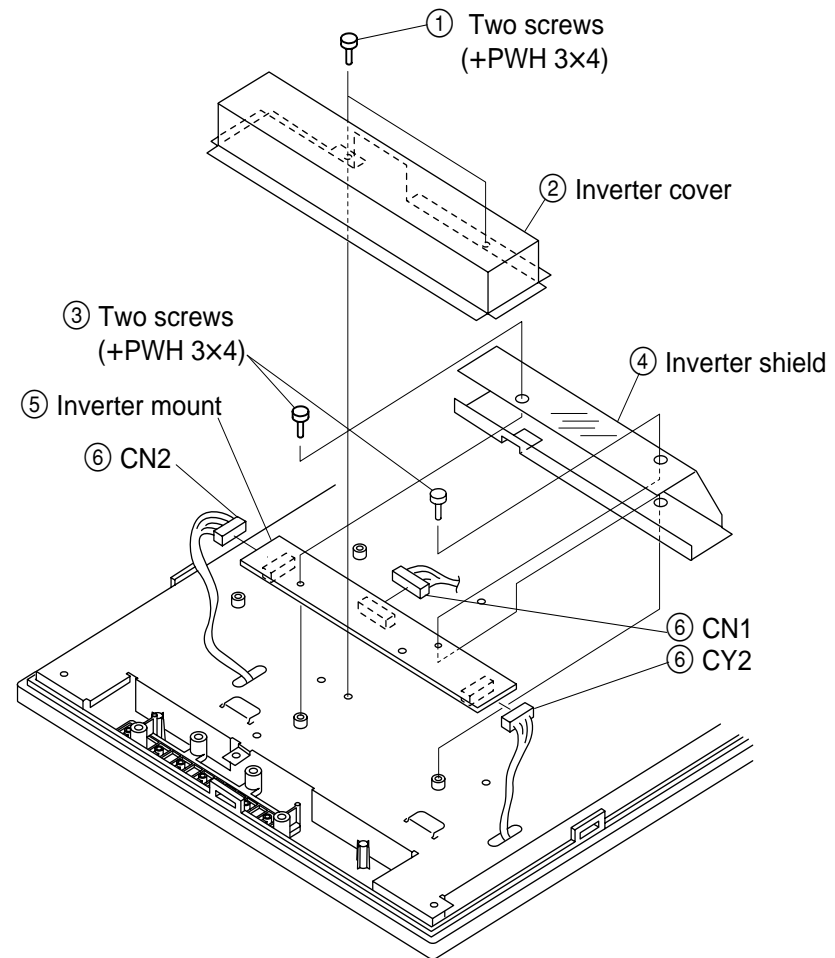
1-1. BACK CABINET AND TFT PANEL REMOVAL



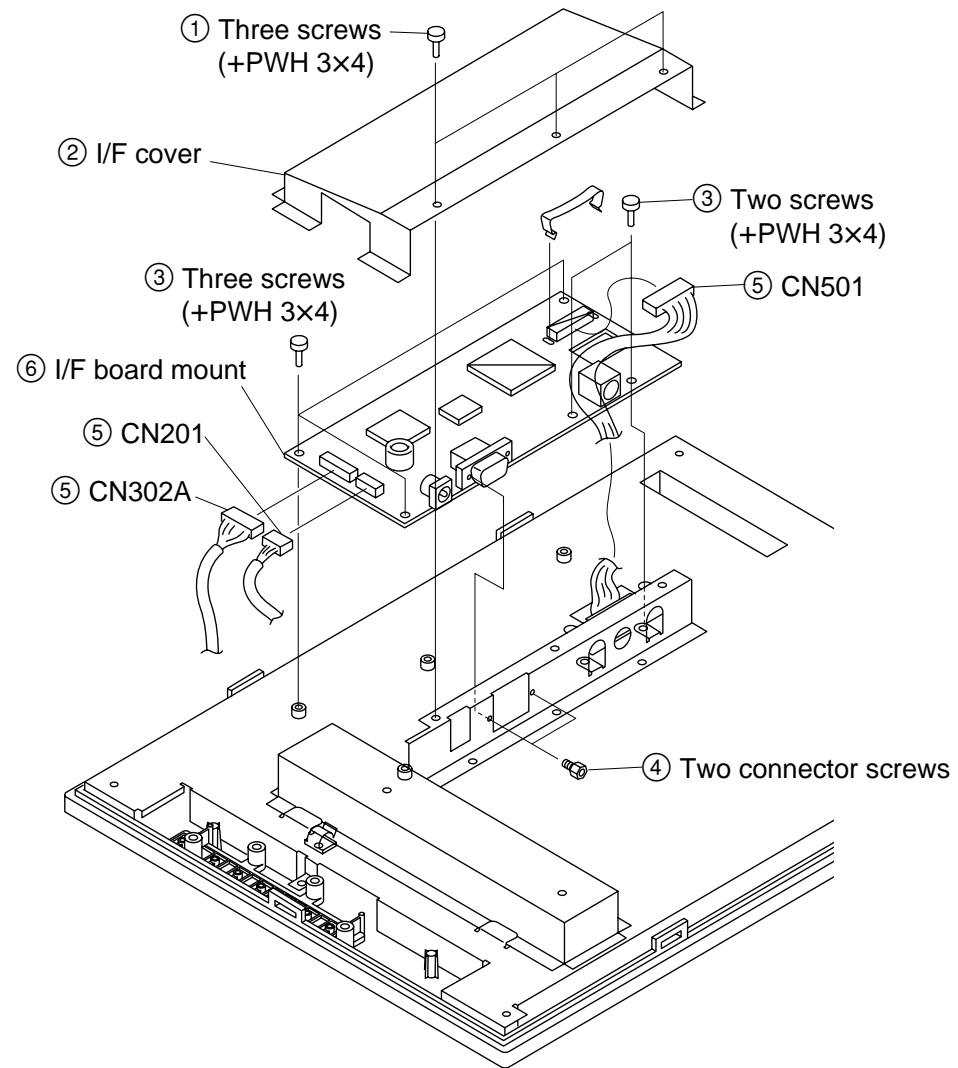
1-2. KEYBOARD MOUNT REMOVAL



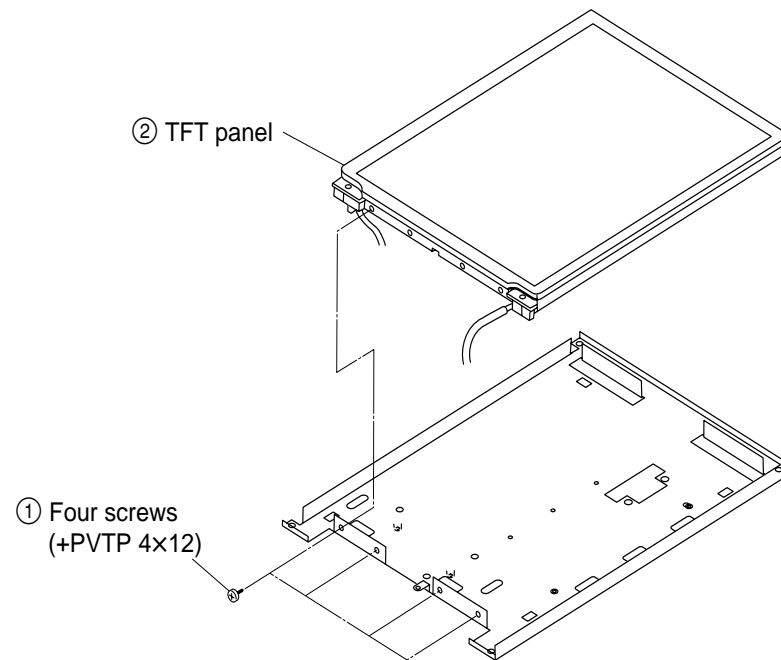
1-3. INVERTER MOUNT REMOVAL



1-4. I/F BOARD REMOVAL



1-5. TFT PANEL REMOVAL



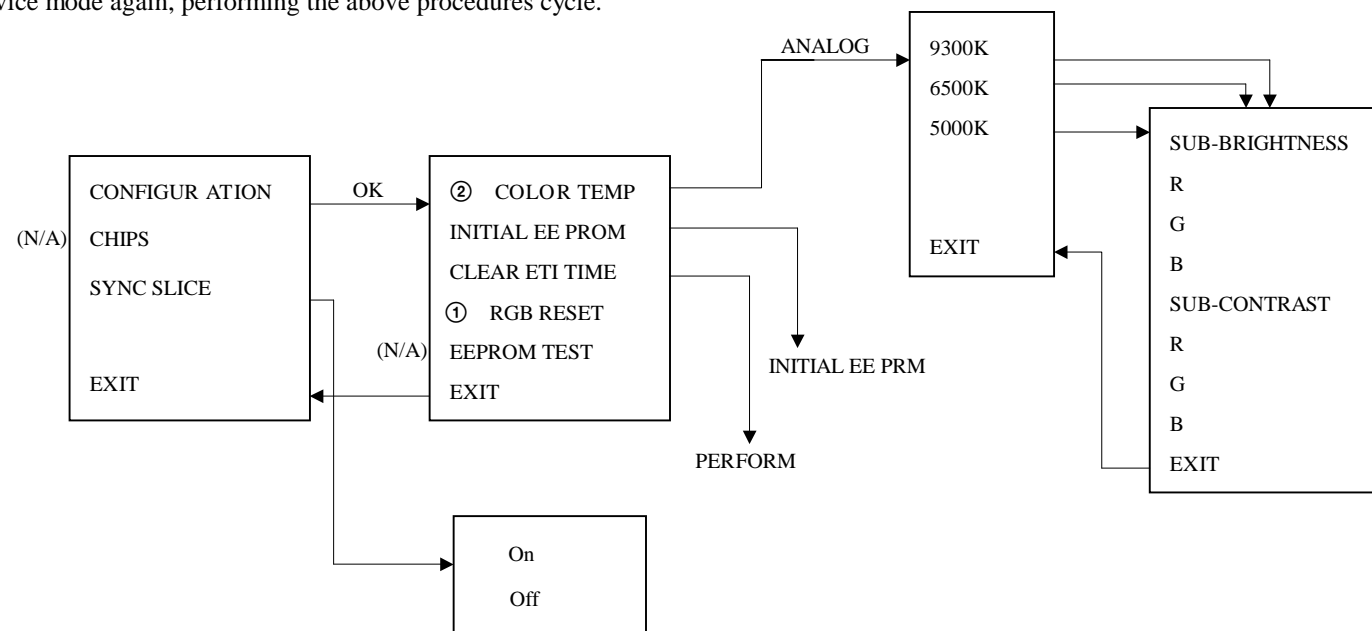
SECTION 2 ADJUSTMENTS

2-1. FUNCTIONAL ALIGNMENT (1)

•Procedures of how to go to service mode.

1. Hold “↑” and “↓” key power on, SDM-S51 goes into service mode.
2. Press “MENU” key-----ODS display → contigulation → RGB Reset → OK → contigulation → Color Temp.
3. Press “-” key to go to second page’s late icon.
4. Press “OK” key-----service menu display.
5. Select one of features.
6. Press “MENU” key to exit OSD.
7. Power OFF then ON again, monitor go to normal mode.

If you would like to enter service mode again, performing the above procedures cycle.



Note

1. N/A means “Not applied”.
2. This service menu only provides both Configuration & Sync slice functions.
This other were used for design engineering. There is no guarantee of using those N/A functions.

2-2. FUNCTIONAL ALIGNMENT (2)

This paper documents the functional alignment (Used Color meter) procedure of Sony LCD monitor SDM-S51.

• Equipment

Computer: PC workstation with Windows 95
Installed PS/2 mouse is required
Software: KSi Engineering alignment software tool
Color meter: Option
Signal generator: Option
Cable: Special RS232 interface cable

• Setup

1. Copy ECS software <ALIGN.EXE> into a new PC directory.
2. Prepare timing & pattern data for signal generator according to Sony's timing specifications.
3. Prepare timing files for <ALIGN.EXE>.
4. Connect monitor interface cable between flat panel monitor and PC com port.
5. Connect monitor video cable to signal generator.
6. Put Topcon 50cm from the monitor; Point it perpendicularly at the center of the display; Achieve the best focus through the eyepiece.
7. Enclose the monitor and Topcon in a light-shield chamber.
8. Set up [SERVICE MODE] of the monitor.

• Download

In order to enhance productivity, a software utility is provided to download default data to LCD monitor. The default data includes color balance data and geometry timing data.

• Operation

1. Execute software <ALIGN.EXE>.
2. Click on 'Setup' menu.
3. Select 'Monitor' type as 'Sony SDM-S81'.
4. Select 'COM PORT' according to hardware connection.
5. Click <OK> to save the new setup configuration.
6. Quit this application and Re-enter to make the new settings effective.

• On Screen Adjustment

1. Click on the 'Monitor' icon; an virtual monitor panel would show up.
2. On entry, the software tries to establish a communication link with the monitor. The monitor internal DACs are read and shown on screen sliders. A 'CONNECT' icon would show up on the lower left corner of the dialog screen.
3. An error message would pop up should communication fail. A 'BREAK' icon would show up on the dialog screen. If this happens, check the hardware setup, communication cable, and the connection.

• Warm up time

Allow 30 minutes warm up time before doing any adjustment.

• Color Adjustment

1. 9300K color adjustment
--Center adjustment--
 - a. Click 'Color Temperature' as '9300'.
 - b. Apply 40% IRE white video field, primary mode.
 - c. Make sure 'backlight' register data is 0 (100%).

d. Click 'Refresh'.

Refer to table 1 for default data for color adjustment.

- e. Adjust 'sub_brt_B' to achieve color temperature. Refer to table 2 for specification.
- f. Click 'Save this color' for a 9300K color save.

2. 5000K color adjustment

- a. Click 'Color Temperature' as '5000'.
- b. Repeat alignment procedure as 9300 steps b-f.

3. 6500K color adjustment

- a. Click 'Color Temperature' as '6500'.
- b. Repeat alignment procedure as 9300 steps b-f.

• Geometry Adjustment

1. Connect the personal computer which has alignment data.
2. Click 'Refresh' (inside Geometry Register Box).
3. Adjust 'Pitch' for optimum screen performance.
4. Adjust 'Phase' for optimum screen performance.
5. Adjust 'H position' to make the screen center horizontally.
6. Adjust 'V position' to make the screen center vertically.
7. Repeat steps 3-6 for best picture performance.
8. Click 'Save Geometry' to perform a user timing mode save.
9. Repeat step 1-7 for each of the user present timings.

2-3. TABLE1 & 2

Table 1: Default data for analog color adjustment

Color	9300K	6500K	5000K
Brightness (G)	50	30	50
Contrast (G)	70	70	70
Sub-BrT-R	30	33	37
Sub-BrT-G	32	32	32
Sub-BrT-B	26	18	12
Sub-Cont-R	128	128	128
Sub-Cont-G	128	128	128
Sub-Cont-B	128	128	128

Table 2: Specifications for color adjustment

Color	x	y	Y (35% IRE)
9300	0.2838	0.2981	10 nit
6500	0.3132	0.3297	10 nit
5000	0.3450	0.3580	10 nit
Tole	± 0.003	± 0.003	± 0.7

Y: Luminance measurements are in cd/m²

2-4. TIMING SPECIFICATION

PRESET MODE	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7	MODE 8
SIGNAL MODE	VESA 60Hz	MAC 13"	VESA 75Hz	VESA 85Hz	VESA 70Hz	VESA 60Hz	VESA 75Hz	VESA 85Hz
RESOLUTION	640 X 480	640 X 480	640 X 480	640 X 480	720 X 400	800 X 600	800 X 600	800 X 600
DOT CLOCK	25.175 MHz	30.240 MHz	31.500 MHz	36.000 MHz	28.350 MHz	40.000 MHz	49.500 MHz	56.250 MHz
HORIZONTAL	usec	usec	usec	usec	usec	usec	usec	usec
H. TOATL	31.778	28.571	26.667	23.111	31.746	26.400	21.333	18.631
H. SYNC	3.813	2.116	2.032	1.556	2.540	3.200	1.616	1.138
H. BP	1.907	3.175	3.810	2.222	3.175	2.200	3.232	2.702
H. ACTIV	25.422	21.164	20.317	17.778	25.397	20.000	16.162	14.222
VERTICAL	msec	msec	msec	msec	msec	msec	msec	msec
V. TOTAL	16.683	15.000	13.333	11.764	14.254	16.579	13.333	11.756
V. SYNC	0.064	0.086	0.080	0.069	0.095	0.106	0.064	0.056
V. BP	1.049	1.114	0.427	0.578	1.079	0.607	0.448	0.503
V. ACTIV	15.253	13.714	12.800	11.093	12.698	15.840	12.800	11.179
H/V POLARITY	N/N	N/N	N/N	N/N	N/P	P/P	P/P	P/P

PRESET MODE	MODE 9	MODE 10	MODE 11	MODE 12	MODE 13	MODE 14	MODE 15	MODE 16
SIGNAL MODE	PMAC 16"	VESA 60Hz	VESA 70Hz	VESA 75Hz	VESA 75Hz	PMAC 19"	MAC	WS
RESOLUTION	832 X 624	1024 X 768	1024 X 768	1024 X 768	1024 X 768	1024 X 768	1152 X 870	1152 X 900
DOT CLOCK	57.285 MHz	65.000 MHz	75.000 MHz	78.750 MHz	94.500 MHz	80.000 MHz	100.000 MHz	92.940 MHz
HORIZONTAL	usec	usec	usec	usec	usec	usec	usec	usec
H. TOATL	20.110	20.677	17.707	16.660	14.561	16.600	14.560	16.182
H. SYNC	1.117	2.092	1.813	1.219	1.016	1.200	1.280	1.377
H. BP	3.910	2.462	1.920	2.235	2.201	2.200	1.440	2.087
H. ACTIV	14.524	15.754	13.653	13.003	10.836	12.800	11.520	12.395
VERTICAL	msec	msec	msec	msec	msec	msec	msec	msec
V. TOTAL	13.413	16.666	14.272	13.328	11.765	13.346	13.322	15.163
V. SYNC	0.060	0.124	0.106	0.050	0.044	0.050	0.048	0.065
V. BP	0.744	0.600	0.513	0.466	0.524	0.498	0.568	0.502
V. ACTIV	12.549	15.880	13.599	12.795	11.183	12.749	12.667	14.564
H/V POLARITY	N/N	N/N	N/N	P/P	P/P	N/N	N/N	N/N

PRESET MODE	MODE 17	MODE 18	MODE 19	MODE 20	MODE 21	MODE 22
SIGNAL MODE	WS	VESA 60Hz	VESA 85Hz	VESA 60Hz	VESA 75Hz	VESA 85Hz
RESOLUTION	1152X 900	1280 X 960	1280 X 960	1280X 1024	1280X 1024	1280X 1024
DOT CLOCK	105.590 MHz	108.000 MHz	148.500 MHz	108.000 MHz	135.000 MHz	157.500 MHz
HORIZONTAL	usec	usec	usec	usec	usec	usec
H. TOATL	13.941	16.667	22.636	15.630	12.504	10.971
H. SYNC	0.909	1.037	1.077	1.037	1.067	1.016
H. BP	1.970	2.889	1.508	2.296	1.837	1.422
H. ACTIV	10.910	11.852	8.620	11.852	9.481	8.127
VERTICAL	msec	msec	msec	msec	msec	msec
V. TOTAL	13.146	16.667	11.764	16.661	13.329	11.761
V. SYNC	0.112	0.050	0.035	0.047	0.038	0.033
V. BP	0.460	0.600	0.547	0.594	0.475	0.483
V. ACTIV	12.547	16.000	11.171	16.005	12.804	11.235
H/V POLARITY	N/N	P/P	P/P	P/P	P/P	P/P

2-5. W/B ALIGNMENT PROCEDURE

A. Measurement Condition:

- Measurement point: Center of screen
- Measurement distance: 50 cm
- Measurement Angle: 90°

B. Measurement equipment:

- Color Analyzer: Minolta CS-1000 or equivalent
- Signal Generator: VG-828D or equivalent

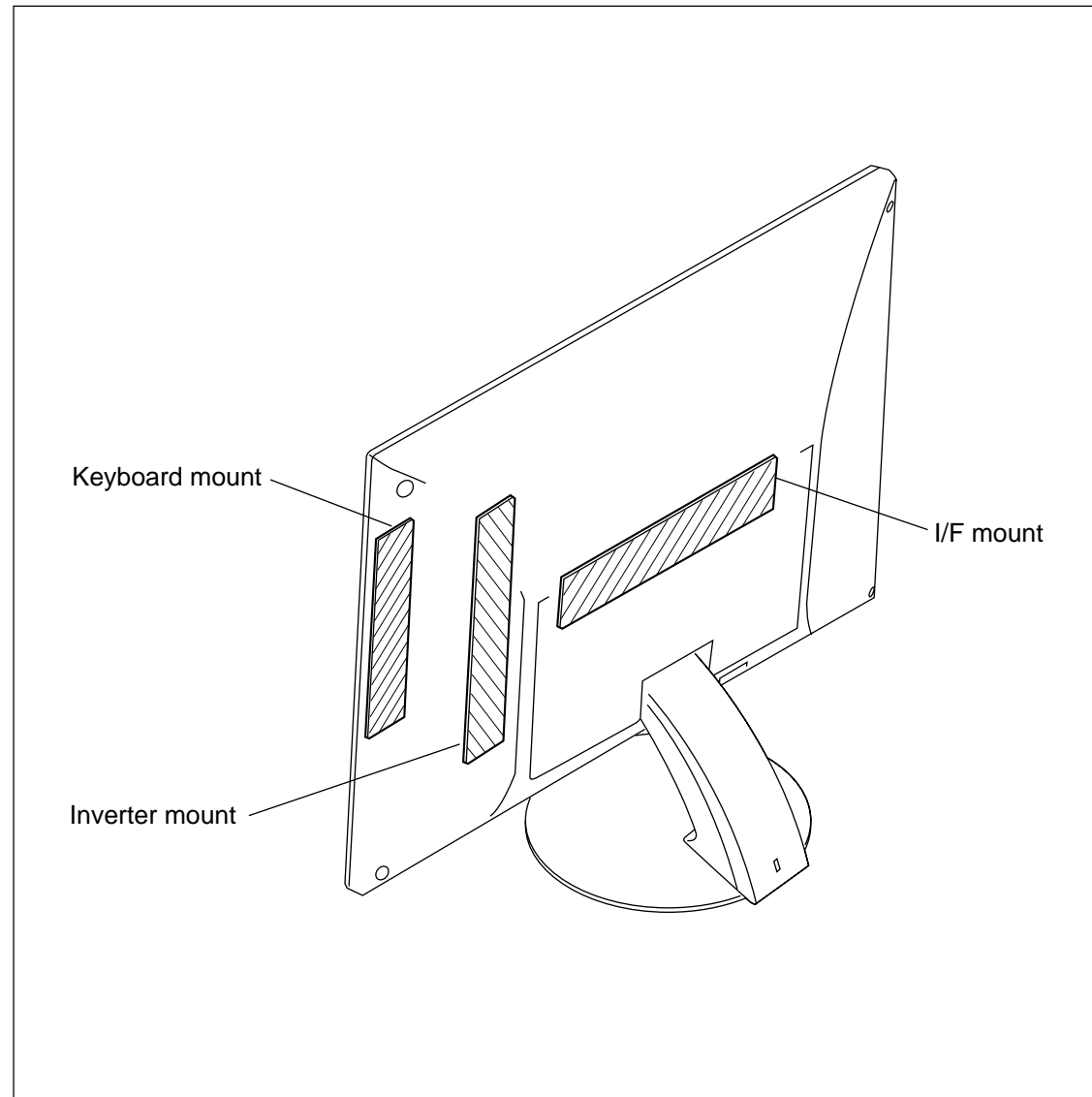
C. Alignment Procedure:

Alignment Procedure	Parameter Setting & Specification					
1. Aging: more than 30 minutes	Burn-in mode: press "BRT"+"OK" then "Power ON"					
2. Enter to "Service Mode"	Service mode: press "▽"+"△" then "Power ON"					
3. RGB reset	Maintain Configuration RGB Reset					
4. Initial Data Setting:	S51:			S81:		
	a. Brightness: 50			a. Brightness: 50		
	b. Contrast: 70			b. Contrast: 70		
	c. Sub-BRT (R/G/B): 128			c. Sub-BRT (R/G/B): 26		
	d. Sub-CONT (R/G/B): 50			d. Sub-CONT (R/G/B): 128		
5. Input gray raster pattern	35 IRE (1024*768, 60K/75Hz)			30 IRE (1280*1024, 80K/75Hz)		
6. Adjust White Balance (9300K, 6500K & 5000K) and Luminance (10 nits @ SONY CS-1000) by Sub-BRT Remark: In normally, adjust G for Luminance (Y), adjust R for x and adjust B for y.		9300K	6500K	5000K	Tolerance	
	x	0.2838	0.3132	0.3450	±0.003	
	y	0.2981	0.3297	0.3580	±0.003	
	Y	10	10	10	±0.7	
7. All mode recall	Select OSD "ALL RESET" function			All mode recall: press "CONTRA ST"+"OK" then "Power ON"		

SECTION 3

DIAGRAMS


3-1. CIRCUIT BOARDS LOCATION




SECTION 4

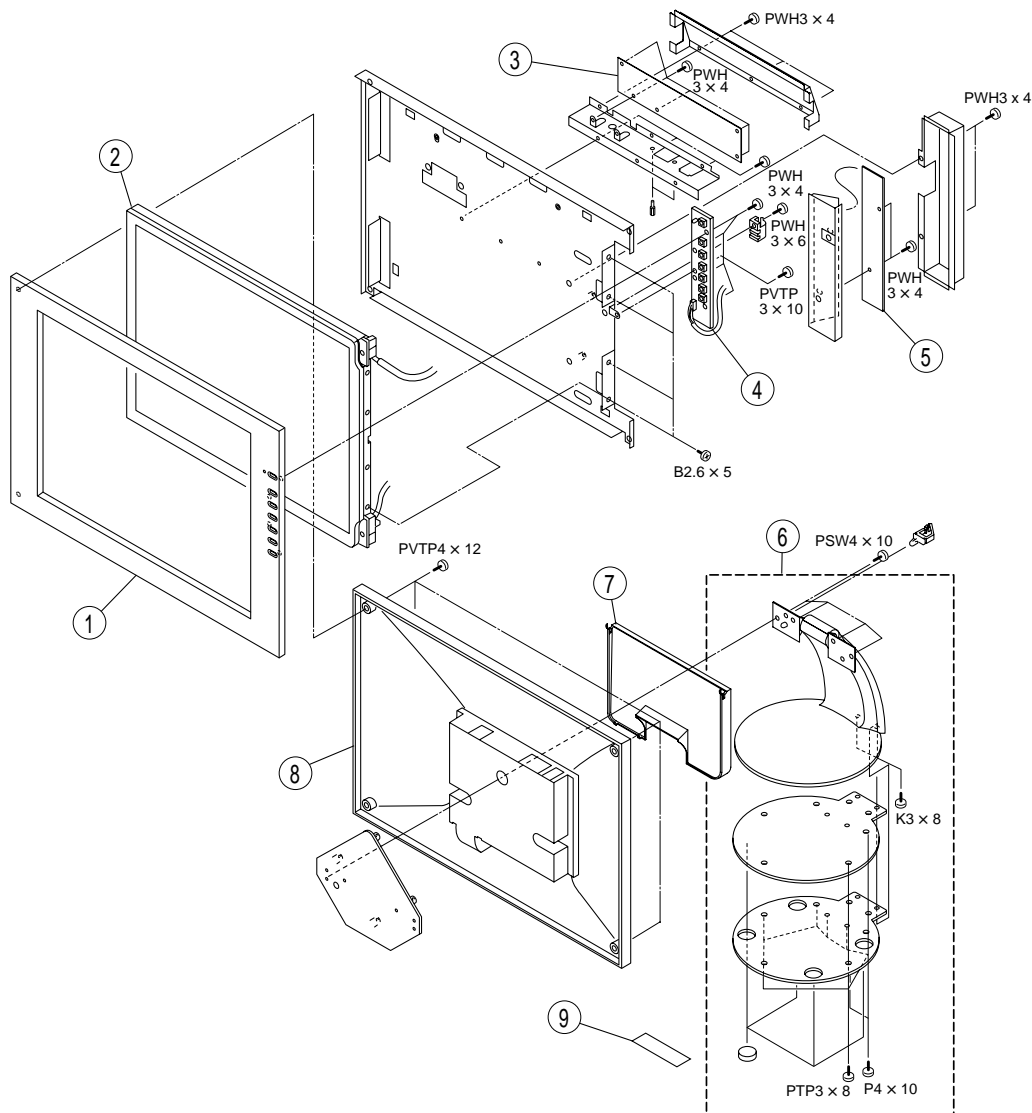
EXPLODED VIEWS

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified  marked are critical for safety.
Replace only with the part number specified.

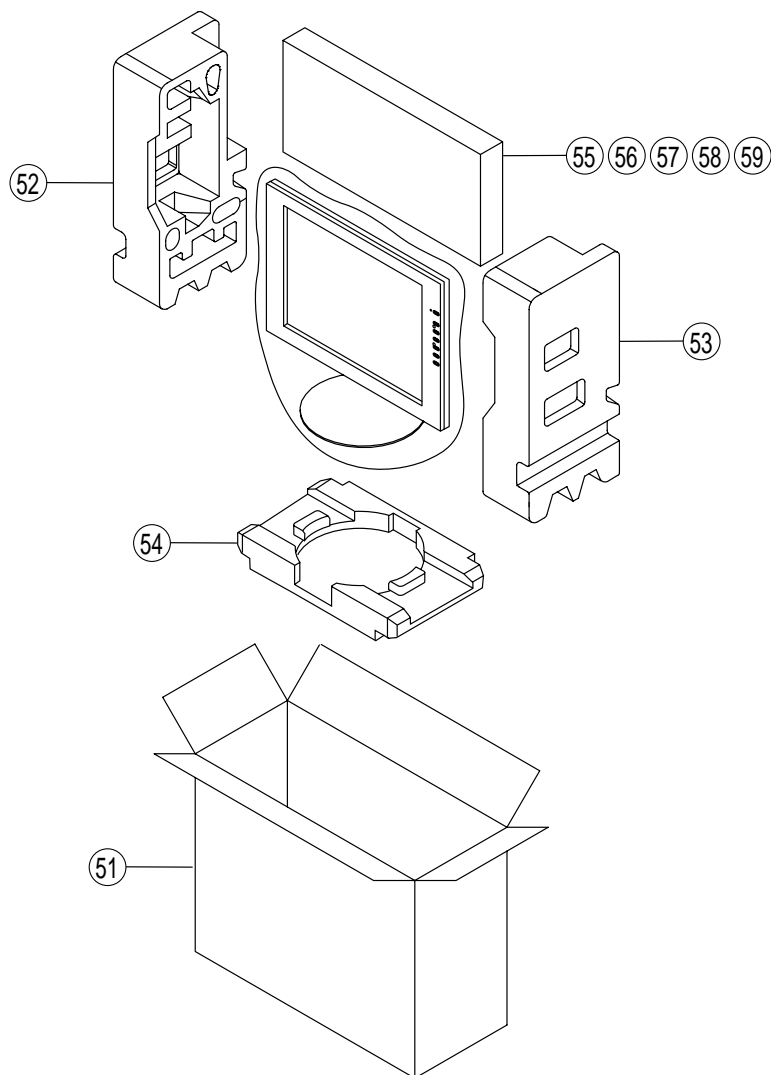
Les composants identifiés par la marque  sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

4-1. CHASSIS



REF.NO.	PART NO.	DESCRIPTION	REMARK
1	4-087-927-01	BEZEL ASSY(WHITE)	
	4-087-930-01	BEZEL ASSY(BLACK)	
2	1-904-691-11	LCD PANEL	
3	1-761-556-11	I/F BOARD MOUNT	
4	1-761-554-11	KEYBOARD MOUNT	
5	1-761-549-11	INVERTER MOUNT	
6	4-087-928-01	STAND ASSY(WHITE)	
	4-087-931-01	STAND ASSY(BLACK)	
7	4-087-919-01	COVER, REAR(WHITE)	
	4-087-920-01	COVER, REAR(BLACK)	
8	4-087-926-01	CABINET ASSY(WHITE)	
	4-087-929-01	CABINET ASSY(BLACK)	

4-2. PACKING MATERIALS



REF.NO.	PART NO.	DESCRIPTION	REMARK
51	4-087-213-01	INDIVIDUAL CARTON	
52	4-087-768-01	CUSHION (LEFT)	
53	4-087-767-01	CUSHION (RIGHT)	
54	4-087-766-01	CUSHION (BOTTOM)	
55	1-477-228-11	ADPTOR, AC(WHITE)	
	1-477-231-11	ADPTOR, AC(BLACK)	
56	1-765-719-11	CORD SET, POWER(BLACK)(AEP)	
	1-765-719-21	CORD SET, POWER(WHITE)(AEP)	
	1-765-720-11	CORD SET, POWER(BLACK)(U/C)	
	1-765-720-21	CORD SET, POWER(WHITE)(U/C)	
57	1-757-371-11	CABLE ASSY(HD15X2)(WHITE)	
	1-757-371-21	CABLE ASSY(HD15X2)(BLACK)	
58	1-772-979-21	DISC, INFORMATION(CD-ROM)	
59	4-087-260-11	MANUAL, INSTRUCTION	

SECTION 5

ELECTRICAL PARTS LIST

NOTE:

The components identified \triangle marked are critical for safety.
Replace only with the part number specified.

Les composants identifiés par la marque \triangle sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

The components identified by \blacksquare in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

RESISTORS

- All resistors are in ohms
- F : nonflammable

*:INVERTER BOARD **:I/F MOUNT

No.	#	Board	Type	△/*	Ref.No.	Part No.	Description	Remarks-1	Remarks-2	Difference
1		A*	FUSE		F201	1-576-633-11				
2		B**	IC		IC302	6-801-646-01	W78E62B-40			

